

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

Claims 1 - 17 (Cancelled)

18. (Currently Amended) A method for enabling a mobile device to roam between a first wireless network and a second wireless network, the first wireless network substantially heterogeneous with the second wireless network, both the first wireless network and the second wireless network capable of communicating with an intermediary network, and the mobile device capable of accessing the first wireless network and the second wireless network, the method comprising the computer-implemented steps of:

receiving a request at the first wireless network to access the second wireless network, the first wireless network substantially heterogeneous with the second wireless network, and the request being on behalf of the mobile device and indicating a network system specifying the second wireless network;

through the intermediary network via the first wireless network, obtaining an access identifier for the second wireless network , the access identifier for use by the mobile device when accessing the second wireless network; and

providing to the mobile device via the first wireless network, the access identifier for the mobile device to use when accessing the second wireless network.

19. (Original) The method of claim 18, wherein the first wireless network is a wireless local area network, the second wireless network is a cellular telecommunications network, and the mobile device is a personal digital assistant.

20. (Original) The method of claim 18, wherein the request includes a user identification of a user of the mobile device, and the step of receiving the request includes determining an identity

of the network system as a function of the user identification.

21. (Original) The method of claim 18, wherein the step of obtaining the access identifier includes providing an authentication request based on the request to a dynamic host configuration server.

22. (Original) The method of claim 18, wherein the access identifier is an internet protocol address and the intermediary network is the internet.

23. (Original) The method of claim 18, wherein the step of obtaining the access identifier includes requesting the access identifier from a network gateway for the second wireless network, the network gateway providing the access identifier from a predefined range of access identifiers allocated to the second wireless network.

24. (Original) The method of claim 18, wherein the step of providing the access identifier includes storing the access identifier in a device database that includes a device identification for the mobile device.

25. (Currently Amended) A network gateway for enabling a mobile device to roam between a first wireless network and a second wireless network, the first wireless network substantially heterogeneous with the second wireless network, both the first wireless network and the second wireless network capable of communicating with an intermediary network, and the mobile device capable of accessing the first wireless network and the second wireless network, the network gateway comprising:

a digital processor that hosts and executes a gateway application for receiving a request to access the second wireless network, the gateway application and the mobile device associated with the first wireless network, and a communications interface coupled with the gateway application, the gateway application configuring the digital processor to:

receive the request through the communication interface and the initial wireless network to access the second wireless network, the first wireless network substantially

heterogeneous with the second wireless network and the request being on behalf of the mobile device and indicating a network system specifying the second wireless network;

obtain through the communications interface, and the intermediary network and via the first wireless network, an access identifier for the second wireless network, the access identifier for use by the mobile device when accessing the second wireless network, and

provide through the communications interface and via the first wireless network the access identifier to the mobile device to use when accessing the second wireless network.

26. (Original) The network gateway of claim 25, wherein the first wireless network is a wireless local area network, the second wireless network is a cellular telecommunications network, and the mobile device is a personal digital assistant.

27. (Original) The network gateway of claim 25, wherein the request includes a user identification of a user of the mobile device, and the gateway application configures the digital processor to determine an identity of the network system as a function of the user identification.

28. (Original) The network gateway of claim 25, wherein the gateway application configures the digital processor to provide through the communications interface an authentication request based on the request to a dynamic host configuration server.

29. (Original) The network gateway of claim 25, wherein the access identifier is an internet protocol address and the intermediary network is the internet.

30. (Original) The network gateway of claim 25, wherein the gateway application configures the digital processor to request through the communications interface the access identifier from a second network gateway for the second wireless network, the second network gateway providing the access identifier from a predefined range of access identifiers allocated to the second wireless network.

31. (Original) The network gateway of claim 25, wherein the gateway application configures the

digital processor to store the access identifier in a device database that includes a device identification for the mobile device.

32. (Currently Amended) A computer program product that includes a computer usable medium having computer program instructions stored thereon for enabling a mobile device to roam between a first wireless network and a second wireless network, the first wireless network substantially heterogeneous with the second wireless network, both the first wireless network and the second wireless network capable of communicating with an intermediary network, and the mobile device capable of accessing the first wireless network and the second wireless network, such that the computer program instructions, when performed by a digital processor, cause the digital processor to:

receive a request at the first wireless network to access the second wireless network, the first wireless network substantially heterogeneous with the second wireless network and the request being on behalf of the mobile device and indicating a network system specifying the second wireless network;

through the intermediary network and via the first wireless network, obtain an access identifier for the second wireless network, the access identifier for use by the mobile device when accessing the second wireless network; and

provide, via the first wireless network, the access identifier to the mobile device to use when accessing the second wireless network.

33. (New) The method of claim 22 wherein the request at the first wireless network to access the second wireless network includes the internet protocol address.

34. (New) The network gateway of claim 29 wherein the request at the first wireless network to access the second wireless network includes the internet protocol address.

RESPONSE

Claims Status

Claims 1-32 were originally filed in this application. An Office Action was issued on April 7, 2006, rejecting claims 1-32 as being unpatentably obvious over U.S. Patent No. 6,201,962 to Sturniolo et al. (“Sturniolo”) and in view of U.S. Patent Publication No. 2002/0056008 to Keane (“Keane”). In this response, Applicants have canceled claims 1-17, amended claims 18, 25 and 32, and added new claims 33 and 34. Support for these amendments and new claims can be found throughout the originally filed claims and specification, and at least at paragraphs [0123], [0130], [0137], [0142], [0154], [0155], at [0171] – [0179] of the application as published as U.S. Patent Application Publication No. 2002/0136226. No new matter has been added.

Applicants respectfully submit that the claims as now presented are patentable over the cited references.

Sturniolo

Sturniolo is directed generally to a gateway controller connected to a local or wide-area network that functions as an intermediary for communications among mobile terminals (i.e., devices) and wireless access points that provide access to the network. (Abstract). The controller allows mobile devices to “roam from one network to another without the need to terminate and reestablish an end to end session between the mobile terminal and a device coupled to the network.” Col. 6 lines 40-43. In order to roam in this way, a “virtual circuit” is established between the controller and the terminal, and the address information relating to the circuit is stored in a state table on the controller and the mobile terminal. Col. 9 lines 37-38. When a mobile terminal roams to a new LAN while communicating with a remote host, it “registers with a new access point and obtains a new network identification.” Col. 18 lines 18-20. Although the mobile device obtains new network identification information, “the contents of the virtual circuit table of the mobile terminal remain unchanged.” Col. 18 lines 21-23. As a result “the host is able to continue communicating with the mobile terminal, and vice versa, regardless of the fact that the network address of the mobile terminal has changed.” Col. 18 lines 24-62.

Keane

Keane is generally directed to techniques for establishing a secure virtual private network (“VPN”) using a publicly available network such as the Internet using an encrypted tunnel. As an example, “a prospective user or customer may contact a mediation point or a control system, such as a network operations center via a base network, such as the Internet, and indicate a desire to establish one or more virtual private networks.” Para. [0094]. In response, “the user receives program code and information for loading onto one or more processors” and “the user then runs or boots the computer with the provided code and information.” Paras. [0094] and [0095]. “After configuration is completed and based on the user's request, the network operations center may enable over the Internet one or more virtual private networks between the gateway and other gateways configured through the network operations center.” Para. [0096]. The users' “computers communicates its consent to the network operations center for establishing a tunnel to the other computer.” Para. [0100]. “If both gateways consent, the network operations center then proceeds to enable a tunnel between the user computers.” Para. [0101].

Independent Claims 18, 25 and 32

Independent claims 18, 25 and 32 each recite, in part, “enabling a mobile device to roam between a first wireless network and a second wireless network,” and “the first network is substantially heterogeneous with the second network.” Specifically, a request is received “at the first wireless network to access a second wireless network,” and “through an intermediary network via the first network” an access identifier is obtained for the mobile device to use when accessing the second network.

As described above, Sturniolo stores session information attributed to a mobile device such that when the device roams to a new access point on the same network, the session information remains valid despite the assignment of a new network ID for the device. In contrast, Applicants claims recite a mobile device accessing substantially heterogeneous networks (e.g., seamlessly transitioning from a wireless IP-based network to a wireless cellular network using GPRS, for example), which do not typically allow for handoffs to each other.

In the Office Action, the Examiner neglected to address the “substantially heterogeneous”

element of claims 18, 25 and 32, and instead cites to various general passages in Sturniolo with regard to dependent claims 19 and 26. Specifically, the Examiner relies on Sturniolo's description of "terminals that can roam from cell to cell and from LAN to LAN" and that terminals can be used to communicate "within a communications system such as a cellular communications system." Sturniolo, col. 5 lines 35-42. Such broad, generalized statements not only do not teach or suggest the provision of seamless roaming among heterogeneous networks, but the text of the Sturniolo disclosure actually contradicts such an interpretation.

1. Homogeneous Not Heterogeneous Networks

The statement on which the Examiner relies implies that roaming takes place among two cells or among two LANs, not among a LAN and a cell or vice versa. In fact, Sturniolo states specifically that each LAN has "generally the same configuration." Sturniolo, col. 5, line 62. Sturniolo describes each LAN as having "a network backbone" that includes "a domain name server or other name resolver" that "performs the conventional function of providing name to network address mapping devices for each LAN." Sturniolo, col. 7, lines 19-29. This indicates that each Sturniolo LAN shares configuration and protocol standards and so is substantially homogeneous.

2. Access Identifier Obtained Via Different Networks

Applicants' amended independent claims each recite, in part, "receiving a request at the first wireless network to access the second wireless network," and "obtaining an access identifier" for the second wireless network "through the intermediary network and via the first wireless network." Sturniolo's mobile terminal, in contrast, queries the second network to obtain a new network address attributed to the second network, and then sends the new network address to the gateway, where it is stored in a state table. As a result, such an approach relies on the device itself to connect to and receive the new network ID from the second network, and only then can the device inform the gateway of its new network ID. The gateway then updates the state table and acts as an intermediary, effectively "masking" the new network ID. Applicants' claimed technique uses the first network to request access to the second network and delivers the access identifier to the device via the first network. By routing the access identifier through the first network, the device already has its access identifier, eliminating the need for Sturniolo's state tables.

As Keane also lacks these elements, and therefore does not cure the deficiencies of Sturniolo. As such, Applicants respectfully submit that independent claims 18, 25 and 32 as amended, as well as those claims that depend therefrom, are patentable over the cited references.